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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,092	07/05/2001	Yonglin Huang	15436249191	4453
22913	7590	10/25/2004	EXAMINER	
WORKMAN NYDEGGER (F/K/A WORKMAN NYDEGGER & SEELEY)			CURTIS, CRAIG	
60 EAST SOUTH TEMPLE 1000 EAGLE GATE TOWER SALT LAKE CITY, UT 84111			ART UNIT	PAPER NUMBER
2872				
DATE MAILED: 10/25/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/900,092	HUANG ET AL.	
	Examiner	Art Unit	
	Craig Curtis	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on Applicants' RCE submitted on 01/28/2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Disposition of the Instant Application

- This Office action is responsive to Applicants' Request for Continued Examination submitted on 28 January 2004, which has been made of record in the file.
- By this amendment, Applicants have amended claims 1, 6, 15, and 21.
- Claims 1-21 presently are pending in the instant application.

Claim Objections

1. **Claims 1-21 are objected to because of the following informalities:** With regard to independent claims 1, 6, 15, and 21, as well as dependent claim 12, Applicants are respectfully requested to amend these claims such that the word *optic* be substituted for each and every occurrence of the word *optical* in these claims. This change in terminology from optical axis to optic axis is deemed necessary in order to remove any potential ambiguity in these claims; the term *optical axis*, after all, has a specific meaning in the optical art (viz., the term is typically used to designate either or both (1) the general direction in which light propagates through a given optical element or optical system and (2) a direction along which a series of optical elements are aligned with respect to one another in a given optical system--which, for a single optical element, such as a lens or mirror, is typically a line that bisects such an element in a longitudinal direction), whereas the term *optic axis* is used to describe a unique crystallographic orientation in a birefringent material for which light propagating through said birefringent material at such orientation will not experience any

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birefringence. In light of this distinction, it is respectfully requested that Applicants further amend the claims so as to identify, in independent claims 1, 6, 15, and 21, that said first wedge, second wedge, third wedge, and fourth wedge are **birefringent**. **With particular reference to claim 1**, it is respectfully requested that Applicants insert the article **a**, once before *first optical axis* (see line 3) and once before *second optical axis* (see line 4), such that the presently recited limitation “...the first wedge having first optical [read: optic] axis that is different from second optical [read: optic] axis of the second wedge...” read as follows: “...the first wedge having a first optic axis that is different from a second optic axis of the second wedge....” **With regard to claims 3, 10, and 19**, while said first and second wedge angles are substantially equal in magnitude, said angles are oppositely signed, and this fact must be reflected in the claims. **Appropriate correction is required.**

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that Applicants regard as their invention.

2. **Claims 1-5 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as their invention. Specifically, with regard to independent claims 1 & 21, the meaning of the recitations “...the second stage is *optically rotated* with respect to the first stage by a second angular displacement that is different from the first angular displacement” (claim 1) and “...a fourth wedge having an optical axis (read: optic axis) that is *optically rotated* from the optical axis (read: optic axis) of the second wedge by 45 degrees” (claim 21) cannot be ascertained by the**

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Examiner. (Emphasis added.) While the Examiner appreciates that by reciting *optically rotated*, Applicants have attempted to distinguish (with specific reference to claim 1) the orientation of the optic axis of the third wedge and the optic axis of the fourth wedge--that, taken together (at least in claim 1), comprise said second stage--as being different, either before or after said second stage is mechanically rotated with respect to said first stage, from the optic axes of said first wedge and said second wedge, respectively, it is respectfully submitted that said second stage does not have a net angular displacement (i.e., a *second angular displacement*) that can reasonably be taken as being "different" from said first angular displacement accomplished by having mechanically rotated said second stage with respect to said first stage. In other words, as depicted in Fig. 2 of the instant invention, while the optic axis of the third wedge (314) is indeed different from the optic axis of the first wedge (310), as is the optic axis of the fourth wedge (316) with respect to that of the second wedge (312), this aspect of the instant invention is not unambiguously conveyed by reciting that said second stage is "optically rotated" with respect to said first stage. Perhaps a less ambiguous way of conveying this aspect of the instant invention would simply be to state that the respective optic axes of the first stage and those of the second stage are not identically oriented, element to respective element, prior to said second stage being mechanically rotated. Such recitation would have the effect of making it clear that, for the sake of example, the first stage and the second stage were not identical prior to said second stage being mechanically rotated with respect to said first stage. In this regard, Applicants are respectfully requested to adopt the approach they took in the drafting of independent claims 6 and 15, in which the term *optically rotated* is not recited. (In any event, the term *optically rotated* is not a legitimate term of art.) And finally, with reference to independent claim 21, it is noted

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that although Fig. 2 of the instant invention depicts the individual orientation of the respective optic axis of each of the first wedge, second wedge, third wedge, and fourth wedge, the reference position(s) (horizontal or vertical) from which each of the recited optical axis orientations (i.e., 45 degrees, 90 degrees, etc.) is to be reckoned **has not been set out in this claim**. This omission has effectively rendered this claim indefinite; for the purposes of the examination of the claim as to its merits, however, the Examiner will assume that Applicants' intended to follow the orientational scheme depicted by Applicants in Fig. 2 of the instant invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. (JP 11-174382 A) in view of Pan et al. (5,566,259).

With regard to claim 1, Sugiyama et al. disclose (see Fig. 1) the invention as claimed--a dual-stage optical isolator comprising:

a first stage (viz., elements 11, 13, and 12) disposed along an optical path (see Fig. 1), wherein the first stage includes a first wedge (11) and a second wedge (12), the first wedge having first optical axis [read: having a first optic axis] that is different from second optical axis [read: from

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a second optic axis] of the second wedge (cf. C₁ & C₂ in the x-y-z coordinate system depicted in Fig. 1); and

a second stage (viz., elements 21, 23, and 22) disposed along said optical path and including a third wedge (21) having a third optical [read: optic] axis and a fourth wedge (22) having a fourth optical [read: optic] axis, wherein the second stage is mechanically rotated with respect to the first stage by a first angular displacement (see Fig. 1)--**EXCEPT FOR** an explicit teaching wherein the second stage is optically rotated with respect to the first stage by a second angular displacement that is different from the first angular displacement.

Pan et al., however, disclose explicitly disclose a first stage (having a first wedge 12A and a second wedge 14A) and a second stage (having a third wedge 12B and a fourth wedge 14B), wherein said second stage is optically rotated (i.e., the respective optic axes of the third and fourth wedges are not identical to those of said first and second wedges) with respect to the first stage by a second angular displacement that is different from [read: angular displacement that is different from] the first angular displacement. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the dual-stage optical isolator of **Sugiyama et al.** such that its second stage be optically rotated with respect to the first stage by a second angular displacement different from the first angular displacement--the non-identical nature of the optic axes of the wedges of the first stage and the second stage, one to another, or respectively, being explicitly taught by **Pan et al.**, for at least the purpose of minimizing polarization dispersion, this aim being taught as the common goal of both the Sugiyama et al. and Pan et al. references.

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With regard to claim 21, Sugiyama et al. disclose the invention as claimed **EXCEPT FOR** an express teaching wherein said third wedge is optically rotated from the optical axis [read: optic axis] of the first wedge by 45 degrees; and a fourth wedge having an optical axis [read: optic axis] that is optically rotated from the optical axis of the second wedge by 45 degrees. In light of the above-recited teachings of Pan et al., however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have oriented said wedges such that their optical axes be oriented as recited in this claim, for at least the purpose of mitigating polarization dispersion to an optimum degree, since it has been held that discovering optimum values of result effective variables involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regard to claims 2 & 5, please see Faraday rotators 13 & 23, respectively, in Fig. 1 of **Sugiyama et al.**; also note that the first wedge has a first wedge angle, the second wedge has a second wedge angle, the third wedge has a third wedge angle, and the fourth wedge has a fourth wedge angle. And with regard to the second Faraday rotator (23) rotating a polarization plane by 45⁰, please see ¶ [0011] on p. 4 of 8 in the translated **Sugiyama et al.** reference

With regard to claim 3, said first and second wedge angles are substantially equal (at least in magnitude, if not in sign). See Fig. 1 of **Sugiyama et al.**

With regard to claim 4, please see ¶ [0011] on p. 4 of 8 in the translated **Sugiyama et al.** reference.

Allowable Subject Matter

4. **Claims 6-20 would be allowable if they are, where appropriate and as required, rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth hereinbefore in this Office action.** With specific reference to independent claim 6, this claim would be allowable over the prior art for at least the reason that the prior art fails to teach or to reasonably suggest *[a]n optical isolator comprising (among other things) a second stage having a second core including a third wedge with a third optical [read: optic] axis that is rotated 45⁰ with respect to the optical [read: optic] axis of the first wedge and a fourth wedge with a fourth optical [read: optic] axis that is rotated 45⁰ with respect to the optical [read: optic] axis of the second wedge.* And with specific reference to independent claim 15, this claim would be allowable over the prior art for at least the reason that the prior art fails to teach or to reasonably suggest *[a]n optical isolator comprising (among other things) second means including a third wedge having a third optical [read: optic] axis that is rotated 45⁰ with respect to the first optical [read: optic] axis and a fourth wedge having a fourth optical [read: optic] axis that is rotated 45⁰ with respect to the second optical [read: optic] axis.*

Response to Arguments

5. Applicants' arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicants' amendments to the claims. Certain claims have been, as set out in detail hereinbefore, objected to; certain claims have been rejected under 35 U.S.C. § 112, second paragraph; certain claims have been rejected, as presently drafted, as

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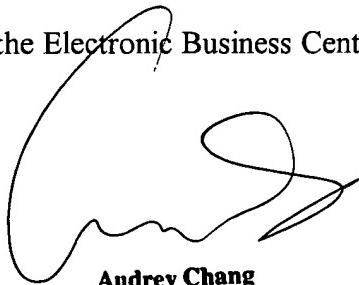
being unpatentable over the cited prior art; and certain claims have been objected to as being allowable if rewritten or amended to overcome the above-mentioned rejection(s) under 35 U.S.C. 112, second paragraph.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (571) 272-2311. The examiner can normally be reached on Monday-Friday, 9:00 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn, can be reached at (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.H.C.
Craig H. Curtis
Group Art Unit
20 October 2004



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